

# Fragmented Phragmites

Overview and Identification of Introduced Exotic and  
Native Forms of Common Reed (*Phragmites australis*)

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# Description

*Phragmites* is a tall, perennial grass that can grow to over 15 feet in height. In North America, both native *Phragmites* (*Phragmites australis americanus* Saltonstall, P.M. Peterson & Soreng) and introduced subspecies occur.

# Comparison of Exotic and Native *Phragmites*





# Non-native *Phragmites australis*



# Background

Preserved remains of native *Phragmites* that are 40,000 years old have been found in the Southwest indicating that it is a part of the native flora of that region.

In coastal areas, preserved rhizome fragments dating back 3000-4000 years have also been found in salt marsh sediments indicating that it is also native to these habitats.

Native American uses of *Phragmites* include use of stems for arrow shafts, musical instruments, ceremonial objects, cigarettes, and both leaves and stems for constructing mats.

European forms of *Phragmites* were probably introduced to North America by accident in ballast material in the late 1700s or early 1800s.

Exotic *Phragmites* first established along the Atlantic coast and then spread across the continent over the course of the 20th century.

*Phragmites* is grown commercially in Europe and is used for thatching, fodder for livestock, and cellulose production. Ironically, it is declining in parts of Europe and its long term survivability is a concern to natural resource managers there.

# Ecological Threat

Non-native forms of *Phragmites* are vigorous growing plants that once introduced can establish and take over a wetland, becoming a monoculture within several years. *Phragmites* crowds out native plants (including the native *Phragmites*), alters wetland hydrology, degrades wildlife habitat, and increases fire potential. The great density and biomass of *Phragmites* occupy most of the available growing space and greatly reduces the amount of light reaching the ground plant. At this time, there is no evidence for the occurrence of hybrid native/introduced populations occurring in the field.

# Distribution in the U.S.

Phragmites *occurs* throughout the lower 48 states and southern Canada (USDA Plants Database).

It has been reported to be *invasive* in natural areas in 18 states including Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maryland, Michigan, North Carolina, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Tennessee, Virginia, Vermont, and Wisconsin, and the District of Columbia (APWG WeedUS Database).



# Habitat in the U.S.

tidal and nontidal wetlands  
brackish and freshwater marshes  
river edges  
shores of lakes and ponds  
roadsides  
disturbed areas

# Growth and Spread

Below ground, *Phragmites* forms a dense network of roots and rhizomes which can go down several feet in depth. It spreads horizontally by sending out rhizome runners which can grow 10 or more feet in a single growing season if conditions are optimal.

New populations of the introduced type of *Phragmites* may appear sparse for the first few years after establishment but the plant's rapid rate of growth and spread allows it to form a pure stand fairly rapidly.

Phragmites can spread by seed which is dispersed mainly by wind and water and by vegetative means via fragments of rhizomes that break off and are transported elsewhere. Individual *Phragmites* plants produce hundreds to thousands of seeds annually. However, seed viability is typically low and there appears to be a great deal of interannual variation in fecundity.

Dispersal to new sites is typically by seed except along rivers and shorelines where fragments of rhizomes may be washed down to new sites where they can establish. Along roadsides, rhizomes fragments may also be transported by heavy machinery between sites.



# Native and Exotic *Phragmites*





# Native vs Exotic *Phragmites*

It is very difficult to definitively distinguish native from introduced *Phragmites* plants without genetic testing due to the plasticity of the species and its ability to adapt to a wide range of conditions.

However, a number of morphological characteristics have now been identified that can be used to determine a population's type. These characters can be subtle (e.g. color variation) and subjective making positive identification difficult.

Given this, an assignment of native or introduced status to a population should not be made unless several characters clearly match the patterns shown in the following slides.



**Introduced**

**Native**



# Native Phrag

Native *Phragmites* occurs in low density stands often comingled with other native plants. Stems grow to a maximum of about 8ft high, are somewhat delicate, very smooth to the touch, and often have a red to chestnut color towards the base. The leaf sheaths fall off in the Fall and stems often do not survive standing through the winter. Leaves are pale to yellow-green. Flowering occurs July to August and the inflorescences are generally sparse, in comparison to the introduced forms.



# Exotic Phrag

Introduced forms of *Phragmites* form very dense stands which include both live stems and standing dead stems from previous year's growth. Stems often reach 15 feet in height, are very rigid, somewhat rough to the touch. Leaves are blue green and darker than the native forms and are elongate, typically 1-1.5 inches wide at their widest point. Flowers form bushy panicles in August and September and are usually purple or golden in color. As seeds mature, the panicles begin to look "fluffy" due to the hairs on the seeds and they take on a grey sheen.



# Morphological Characters

- Ligule width
- Length of lower and upper glumes
- Adherence of leaf sheaths
- Stem color
- Stem spots
- Stem density
- Leaf color
- Habitat

## A WORD OF CAUTION

This information should not be used to distinguish between *Phragmites* populations along the Gulf Coast where another type of *Phragmites*, the Gulf Coast type, which looks similar to introduced *Phragmites*, is also found.



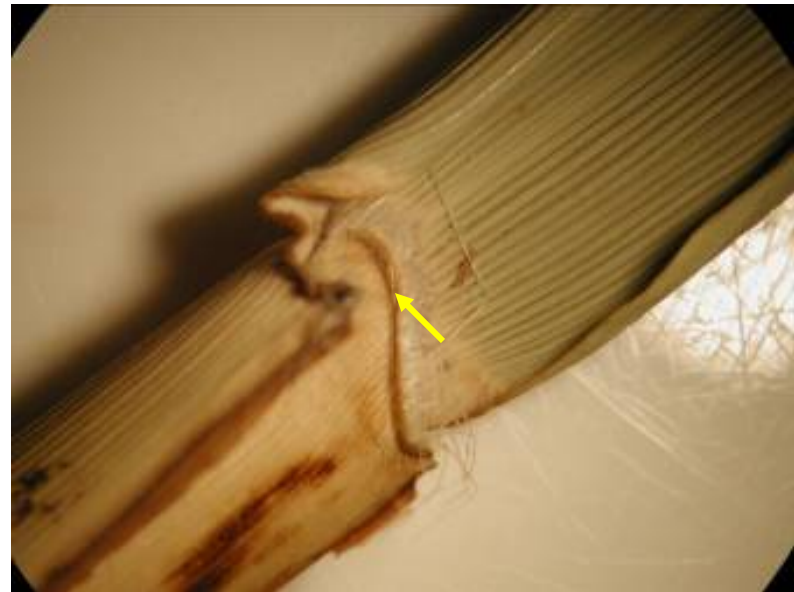
# Ligule width

**Native**



**> 1 mm**  
(1.0 - 1.7 mm)

**Introduced**



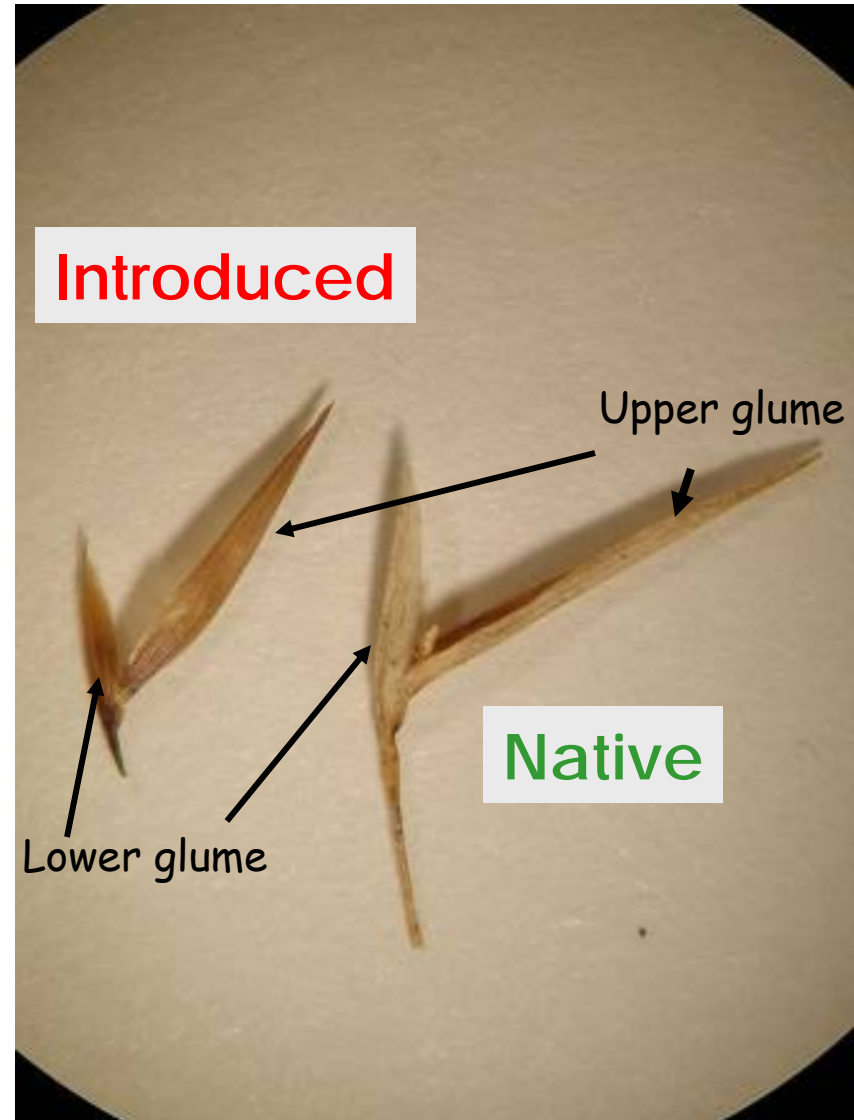
**< 1mm**  
(0.4 - 0.9 mm)

# Glume length



Introduced: Most  $<4.0$   
(2.5 - 5.0 mm)

Native: Most  $>4.0$   
(3.5-6.5 mm)



# Leaf Sheath Persistence



Most leaf sheaths missing or very loosely attached to over wintering culms.



Nearly ALL leaf sheaths present on over wintering culms.



# Stem coloration



Red color is more likely on natives





# Stem spots

Introduced

Native

# Plant Color

Native



Lighter yellow-green

Introduced



Darker blue-green

# Stem Density

## Native

May occur as a monoculture but often co-occurs with other plant species

## Introduced

Typically grows as a monoculture, young newly established populations and those in areas of high salinity may be less dense

# Management Options

- Biological control
- Chemical
- Mechanical
- Prescribed burning

# Acknowledgements

Dr. Kristin Saltonstall

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<http://ian.umces.edu/pdfs/iannewsletter7.pdf>

Ecology and Management of Invasive Plants Program

<http://www.invasiveplants.net/phragmites/morphology.htm>